

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

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1                    Claims 1-3 (Canceled)

1                    Claim 4 (Currently amended): Device for analyzing an  
2                    object (2), for example a radioactive waste package, that  
3                    may contain fissile material or fertile material or both,  
4                    the fissile material comprising M fissile isotopes and the  
5                    fertile material comprising N fertile isotopes, where M and  
6                    N are integer numbers equal to at least 1, this device  
7                    being characterized in that it comprises:

8                    -means (8, 10) ~~of~~ for irradiating the object by  
9                    generating a sequence of initial fast neutron  
10                   pulses which comprises a neutron flux consisting  
11                   of thermal, epithermal and fast neutrons ~~and~~  
12                   ~~resulting from a sequence of initial fast neutron~~  
13                   ~~pulses~~, the thermal neutrons causing fissions in  
14                   the fissile material and the epithermal and fast  
15                   neutrons causing fissions in the fissile material  
16                   and in the fertile material, said means of  
17                   irradiating comprising at least one source of  
18                   fast neutrons operating in pulsed mode and means  
19                   of thermalizing these fast neutrons, said means

20 of thermalizing being capable of providing said  
21 neutron flux consisting of said thermal,  
22 epithermal and fast neutrons,  
23 -means (4, 52) ~~of for~~ counting neutrons, ~~designed~~  
24 ~~and to measure for measuring~~ prompt and delayed  
25 neutronic signals emitted by the object after  
26 each pulse, and  
27 -means (6) ~~of processing the signals thus~~  
28 ~~measured, designed to accumulate these for~~  
29 accumulating the measured prompt and delayed  
30 neutronic signals and, after the last pulse, to  
31 ~~obtain for obtaining~~ the sum of all signals, to  
32 ~~use and for using~~ this sum ~~to determine for~~  
33 determining the contribution  $S_p$  of the prompt  
34 neutrons produced by the thermal fissions and the  
35 contribution  $S_r$  of the delayed neutrons produced  
36 by the thermal, epithermal and fast fissions and  
37 ~~to determine for determining~~ the quantity of each  
38 of the M+N isotopes from  $S_p$  and  $S_r$  and from at  
39 least M+N-2 additional items of information  
40 related to the quantities of the M+N isotopes,  
41 expressing  $S_p$  and  $S_r$  as linear combinations of  
42 these quantities, the coefficients of these  
43 linear combinations being determined beforehand  
44 by calibration.

1 Claim 5 (Canceled)

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1           Claim 6 (Currently amended): Device according to  
2   claim 5 4, in which the thermalization means comprises a  
3   containment (10) that includes a central area (12) in which  
4   the object (2) will be placed and in which at least three  
5   sides are delimited by a thickness (14, 60) of moderator  
6   material, the neutron source (8) being placed in a fourth  
7   side of this containment and the neutron counting  
8   means (4, 52) being placed on the three sides between the  
9   central area and the thickness of moderator material, a  
10   thickness of neutron multiplier material (22, 24, 50) being  
11   provided between the central area and the neutron source  
12   and between the central area and neutron counting  
13   means, ~~the neutron multiplier material being Pb.~~

1           Claim 7 (Previously presented): Device according to  
2   claim 6, in which each neutron counting means is also  
3   surrounded by a thickness (26) of neutron poison material.

1           Claim 8 (Previously presented): Device according to  
2   claim 6, in which each neutron counting means is also  
3   surrounded by a moderator material (28).

1           Claim 9 (Previously presented): Device according to  
2   claim 6, also comprising a wall (36) made of neutron poison  
3   and moderator materials that delimits the fourth side of  
4   the containment, a corresponding thickness (223) of the

5 multiplier material being between this wall (36) and the  
6 central area (12).

1 Claim 10 (Previously presented): Device according to  
2 claim 6, also comprising means (46, 48, 68, 70, 72) of  
3 rotating the object (2) within the central area of the  
4 containment.

1 Claim 11 (New): A device according to claim 4, in  
2 which the means of thermalizing comprises a containment  
3 that includes a central area in which the object will be  
4 placed and in which at least three sides are delimited by  
5 a thickness of moderator material, the neutron source being  
6 placed in a fourth side of this containment and the neutron  
7 counting means being placed between the central area and  
8 the thickness of moderator material, a thickness of neutron  
9 multiplier material being provided at least between the  
10 central area and the neutron source, the device also  
11 comprising a wall at least made of a neutron poison  
12 material that delimits the fourth side of the containment,  
13 a corresponding thickness of the multiplier material being  
14 between this wall and the central area.

1 Claim 12 (new): A device according to claim 4,  
2 wherein  $M$  equals 3 and  $N$  equals 1.

1           Claim 13 (new): A device according to claim 12,  
2           wherein the 3 fissile isotopes are uranium 233, uranium 235  
3           and plutonium 239 and the fertile isotope is uranium 238.

1           Claim 14 (new): A device according to claim 6 wherein  
2           the neutron multiplier material is Pb.

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Concluded